REMARKS

Claims 1-12, 26-34, 43, 44 and 63-73 are pending. Claims 10m and 11 are amended. Claims 64-73 are new claims.

The Office has withdrawn the finality of the office action dated August 26, 2003, which also indicated the allowability of claims 10, 11, 26-34, 43 and 44. At present, only claims 10 and 11 are allowed. .In response to the previous indication of finality and allowability, Applicant cancelled claims 1-9 and 12. This was done to expedite the allowance of claims that were then indicated to be allowable; however, this present Office action abrogates this reason for cancellation. Accordingly, the present amendment reinstates the former claims 1-9 and 12, which are now presented as claims 64-73. Claims 10 and 11 have been amended to recite a "polypeptide."

The Office objects to claims 10 and 11 and suggests that amending "peptide" to –polypeptide—will overcome the objection. This has been done. The Office further suggests amending "mannanase A" to –ManA—to overcome a further objection. This also has been done.

Claims 26-34, 43-44 and 63 stand rejected under 35 U.S.C. §112, first paragraph because the specification is enabling for ManA having the sequence of SEQID No. 1, is deemed not to be enabling for any such enzyme having the sequence identity as claimed. It is asserted that the specification does not provide a scope of enablement that is commensurate with the scope of the claims. We respectfully traverse.

The Office is responding as though Applicant has provided no rationale, guidance or representative compounds, when in fact the specification does contain a showing of enablement that is commensurate with the scope of the claims. Applicant has met the requirement, for example, by comparison of conserved residues where these residues are common structural features of the claimed genus (see Table 3 bridging pages 33 and 34 of the specification as filed). Furthermore, a great number of GH5, CBDII and CBDIII family domains are well known in the art. See the Declaration of Shi-You Ding filed in response to the office action dated January 10, 2003. It is apparent to those skilled in the

art on the basis of the present disclosure that the process of comparison to deduce conserved residues may be repeated in the same manner shown and described. Applicant has characterized the polypeptide sequence by domain or region in remarks, for example, on page 18 at .lines 18-26. Applicant has provided guidance for making deletions or substitutions in a discussion on page 19 at lines 8-20, and has discussed suitable techniques including fusion proteins and site directed mutagenesis on page 20 of the specification.

Cases before the Court of Appeals for the Federal Circuit have considered what showing may be sufficient to meet a genus-type claim when a species is specifically enabled in the working examples. There is no need to show each and every possible embodiment. A representative number of species will suffice, as will sufficient rationale or guidance as in the present case.

The ultimate issue is whether undue experimentation is required. To establish this standard, the Office presently relies upon *In re Wands*, 8 USPQ 2d 1400 (Fed. Cir. 1988) and so admits that a satisfactory showing may include: (1) the quantity of experimentation necessary; (2) the amount of direction or guidance presented; (3) the presence or absence of working examples; (4) the nature of the invention, (5) the state of the prior art. (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and the breadth of the claims. These rules are not applied in a vacuum. In *Wands*, the issue was the predictability of being able to make a particular monoclonal antibody. The court said:

> Enablement is not precluded by the necessity for some experimentation such as routine screening. However, experimentation needed to practice the invention must not be undue experimentation. The key word is 'undue,' not experimentation" . . .The determination of what constitutes undue experimentation in a given case requires the application of a standard of reasonableness, having due regard for the nature of the invention and the state of the art. The test is not merely quantitative, since a considerable amount of experimentation is permissible, if it is merely routine, or if the specification in question provides a reasonable amount of guidance with respect to the direction in which the experimentation should proceed." *Id.* at 1404.

In the relevant art at the time this application was filed, the level of ordinary skill was quite high. It is also the case that routine experimentation in this art may encounter failures in addition to successes. Therefore, when applying the *Wands* "standard of reasonableness" to the situation in this art means it is not undue nor is it unexpected to encounter some failure. The important point is that some experimentation is not undue for this art. Applicant has provided reasonable guidance and rationale for performing this type of work.

The Office finds that it is not routine in the art to modify an amino acid sequence when the results of such modification are unknown, and the success of such modification is are unpredictable. We disagree and assert that it is routine in the art to make such modifications. If the examiner wishes to pursue this line of reasoning, it will be necessary for the examiner to provide a reference showing that it is not routine. Initially, the Office must accept the objective truth of statements made in the specification. If such statements are to be called into question, the Office is burdened with providing evidence or convincing argument why those of skill in the art would doubt the statements. *In re Marzocchi*, 439 F.2d 220, 169 USPQ 367 (CCPA 1971). Applicant asserts that the Office has not met this burden.

The Office finds that the specification does not establish a variety of things to make the result of modifications predictable, such as the regions of the protein structure which may be modified without affecting mannanase activity, the general tolerance to mannanase to modification, or a rationale and predictable scheme for modification. In response, we direct the examiner's attention to Table 3 and other portions of the specification that are noted in remarks above.

In summary, the foregoing remarks show that enablement is commensurate with the scope of the claims, and so we request withdrawal of the rejection.

Claims 26-27, 44 and 63 stand rejected under 35 USC §102(b) over Johnson et al. (1990). Although Johnson et al does not disclose any sequence at all, the Office takes the position that it is ill-equipped to show a distinction between that reference and the present claims, and so shifts that burden to Applicant. The attached Declaration of William

Adney shows this distinction. Mr. Adney has used the DSGene program to calculate a molecular weight of the disclosed ManA peptide. It is 80,349.9 Daltons. This compares to four mannanase enzymes reported by Johnson et al. These mannanases are shown in Table 2 on page 251 thereof to have respective molecular weights of 44,700, 43,600, 57,500, and 33,900. These do not compare to 80,349, and the enzymes cannot be the same.

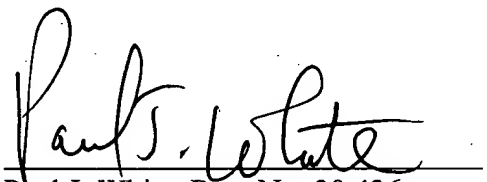
Applicant has met its showing, and the claims are not anticipated. We request withdrawal of the §102 rejection.

Claims 28-34, and 43 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Johnson et al as applied above, and further in view of reasonable common knowledge regarding determining the amino acid sequence and making proteins with a peptide tag, such as a 6-His tag. The Office cannot have it both ways where no sequence is specifically enabled unless it is particularly shown (this is the enablement issue disposed above), and then also there is reasonable common knowledge of the type described. Even so, we tend to agree with the Examiner that there is reasonable common knowledge in this art which can be adapted and applied to make new things. We diverge and disagree as to the present combination of reasonable knowledge with Johnson et al., because the sequences that are particularly claimed are not suggested or taught by the combination and because Applicant has met the burden of showing that the Johnson et al enzyme is very different from what is claimed.

Based upon the foregoing discussion, we submit that claims 1-12, 26-34, 43, 44 and 63-73 are in allowable condition. We respectfully solicit a Notice of Allowance.

Applicants' attorney respectfully solicits a Notice of Allowance in this application. The Commissioner is authorized to charge any additionally required fees to deposit account 14-0460. Should the Examiner have any questions, comments, or suggestions that would expedite the prosecution of the present case to allowance, Applicants' undersigned representative earnestly requests a telephone call at (303) 384-7575.

Respectfully Submitted,



Date: May 14, 2004.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Shi-You Ding et al.	Examiner:	Rao, Manjunath N.
Serial No.	09/917,378	Group Art Unit:	1652
Filed:	July 28, 2001	Confirmation No.	9985
For:	THERMAL TOLERANT MANNANASE FROM ACIDOTHERMUS CELLULOLYTICUS	**Atty. Dkt. No.**	**NREL 01-35**

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DECLARATION OF WILLIAM S. ADNEY
37 C.F.R. §1.132

1. I am the William S. Adney who is named as an inventor in the above-identified application.

2. This declaration is provided to present the Examiner with additional information that may be relevant to patentability of the presently claimed invention.

3. I am currently employed at the National Renewable energy laboratory in Golden, Colorado, which is the assignee of my invention.

4. It has come to my attention that one issue in this application involves a new reference, namely, Johnson et al., World J. Microbiol. Biotechnol. Vol. 6(3):245-254.

5. The Office ahs shifted the burden to the applicant in a manner that requires the Applicant to show that the present claims are directed towards a different mannanase than is shown and described in Johnson et al.

6. Page 251 of Johnson et al. relates characteristics of the four mannanases that are described in that article, in summary:

∃-mannanase	Mol. Wt.
A	44,700
B	43,600
C	57,500
2A	33,900

7. To assess whether any of the mannanases reported by Johnson et al. could be the sequence reported as ManA, I used a computer program (DSGene—a conventional program for this purpose) to calculate the molecular weight of the ManA sequence that we report as SEQID NO. 1:

MGLVRRPARAFVATAAGTAVAAAATLGSITMPSATAAPAGFVTASG- GQFV
LNGLPYRYGGTNNYYLSYQSHADVDDVLAKAQAMNLSVIRTWGFIDIGSL
DGSVPTIDGNKNGFYFQYWDPSTGAPAYNDGPTGLQGLDYAIASAAAHGL
RVIVVLTNDWKEFGGMDQYDKWYGLPYHDNFYTDPRTQQAYKNWVNHLLN
RVNSITGVTYKNDPTIFAWELANEPRCVGSGTLPTSGTCTQATIVNWVDQ
MSAYVKSIDPNHMVSVGDEGFYIGSTQGSGWPYNDPSDGVDNNALLRVKN
IDFGTYHLYPNYWGQNADWGTQWIKDHIANAAAIGKPTILEEFGWQTPDR
DSVYQTWTQTVRTNGEAGWNFWMLAGNVNGQPYPNYDGFNVYYPSSTATV
LASEALAISTGTSPPPSPSSSPSSSPSPSPSPSASPSASPSASSSPSPSP
SSSPVSGGVKVQYKNNDSAPGDNQIKPGLQLVNTGSSSVDLSTVTVRYWF
TRDGGSSTLVYNCDWAAMGCGNIRASFGSVNPATPTADTYLQLSFTGGTL
AAGGSTGEIQNRVNKSDWSNFDETNDYSYGTNTAFQDWTKVTVYVNGRLV
WGTEPSGTSPSPTPSPSPTPSPSPSPTPSPSSSPSPSPSPSPTPSPSP
SPSPSPSVSSSGVGCRATYVVNSDWGSGFTATVTVTNTGSRATSGWTVAW
SFGGNQTVTNYWNTALTQSGASVTATNLSYNNVIQPGQSTTFGFNGSYSG TNTAPTLTCTAS

8. The calculation results yielded a predictive molecular weight of 80,349.9 Daltons.

9. On the basis of comparing the molecular weight of 80,349.9 Daltons to the molecular weights shown in paragraph 6 above, and further because the Polyporous versicolor organism described in Johnson et al. is eukaryotic, I conclude that SEQ ID NO. 1 is not even closely related to any of the mannanases described by Johnson et al.

10. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18

U.S.C. § 1001, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: 14 May 2004 By: William S Adney
William S. Adney.